

**In the claims:**

**Amend claims 1, 6, 7, 11, 17, 19 and 20 of claims 1-24.**

1           1.       (Currently Amended)       A magnetic head assembly having a head surface  
2 comprising:

3           a write head including:

4                 ferromagnetic first and second pole pieces that have a yoke portion located between  
5 a pole tip portion and a back gap portion;

6                 a nonmagnetic write gap layer located between the pole tip portions of the first and  
7 second pole pieces;

8                 an insulation stack with at least one coil layer embedded therein located between  
9 the yoke portions of the first and second pole pieces:

10                the first and second pole pieces being connected at their back gap portions;

11                the pole tip portion of the first pole piece having non-overlapping first and second  
12 components wherein the first component forms a portion of the head surface and the  
13 second component is recessed from the head surface and is magnetically connected to the  
14 first component; and

15                the first and second components having a height into the head assembly which is measured  
16 from a centerline that is perpendicular to said head surface;

17                each of the first and second components being located along said centerline so that the  
18 centerline bisects each of the first and second components with the second component being an  
19 extension of the first component into the head assembly along the centerline;

20                the second component having a width that is less than a width of the first component  
21 wherein said widths are parallel to the head surface and parallel to a major plane of the write gap  
22 layer;

23                a read head; and

24                the first pole piece being located between the read head and the second pole piece.

1           2.       (Previously Presented)       A magnetic head assembly as claimed in claim 1  
2 further comprising:

3                the first pole piece having a third component that is recessed from the head surface and that  
4 has a width that is parallel to the head surface and the major plane of the write gap layer;

5                the second component interconnecting the first and third components; and

6                the width of the third component being greater than the width of the second component.

1           3.     (Previously Presented)   A magnetic head assembly having an air bearing surface  
2     (ABS) and comprising:  
3         a write head including:  
4             ferromagnetic first and second pole piece layers that have a yoke portion located  
5             between a pole tip portion and a back gap portion;  
6             a nonmagnetic write gap layer located between the pole tip portions of the first and  
7             second pole piece layers;  
8             an insulation stack with at least one coil layer embedded therein located between  
9             the yoke portions of the first and second pole piece layers;  
10            the first and second pole piece layers being connected at their back gap portions;  
11            the pole tip portion of the first pole piece layer having first and second components  
12            wherein the first component forms a portion of the ABS and the second component is  
13            recessed from the ABS and is magnetically connected to the first component;  
14            the second component having a width that is less than a width of the first  
15            component wherein said widths are parallel to the ABS and parallel to a major plane of the  
16            write gap layer;  
17            the first pole piece layer having a third component that is recessed from the ABS  
18            and having a width that is parallel to the ABS and the major thin film plane of the write  
19            gap layer;  
20            the second component interconnecting the first and third components;  
21            the width of the third component being greater than the width of the second  
22            component;  
23            the first pole piece layer having a base layer and a pedestal wherein the pedestal  
24            forms a portion of the ABS; and  
25            the pedestal interconnecting the base layer and the first component.

1           4.       (Previously Presented)     A magnetic head assembly as claimed in claim 1 further  
2 comprising:

3           the read head including:

4                 a read sensor;

5                 nonmagnetic electrically nonconductive first and second read gap layers;

6                 the read sensor being located between the first and second read gap layers;

7                 a ferromagnetic first shield layer; and

8                 the first and second read gap layers being located between the first shield layer and  
9 the first pole piece.

1           5.       (Previously Presented)     A magnetic head assembly as claimed in claim 4 further  
2 comprising:

3           the first pole piece having a third component that is recessed from the ABS and has a width  
4 that is parallel to the head surface and a major plane of the write gap layer;

5           the second component interconnecting the first and third components; and

6           the width of the third component being greater than the width of the second component.

1           6.       (Currently Amended)     A magnetic head assembly having an air bearing surface  
2 (ABS) and comprising:

3           a write head including:

4                 ferromagnetic first and second pole piece layers that have a yoke portion located  
5 between a pole tip portion and a back gap portion;

6                 a nonmagnetic write gap layer located between the pole tip portions of the first and  
7 second pole piece layers;

8                 an insulation stack with at least one coil layer embedded therein located between  
9 the yoke portions of the first and second pole piece layers;

10                 the first and second pole piece layers being connected at their back gap portions;

11                 the pole tip portion of the first pole piece layer having first and second components  
12 wherein the first component forms a portion of the ABS and the second component is  
13 recessed from the ABS and is magnetically connected to the first component;

14           the first and second components having a height into the head assembly which is  
15           measured from a centerline that is perpendicular to said ABS;

16           each of the first and second components being located along said centerline so that  
17           the centerline bisects each of the first and second components with the second component  
18           being an extension of the first component into the head assembly along the centerline;

19           the second component having a width that is less than a width of the first  
20           component wherein said widths are parallel to the ABS and parallel to a major plane of the  
21           write gap layer;

22           the first pole piece layer having a third component that is recessed from the ABS  
23           and having a width that is parallel to the ABS and the major thin film plane of the write  
24           gap layer;

25           the second component interconnecting the first and third components;

26           the width of the third component being greater than the width of the second  
27           component;

28           the first pole piece layer having a base layer and a pedestal wherein the pedestal  
29           forms a portion of the ABS; and

30           the pedestal interconnecting the base layer and the first component.;

31           a read head including:

32           a read sensor;

33           nonmagnetic electrically nonconductive first and second read gap layers;

34           the read sensor being located between the first and second read gap layers;

35           a ferromagnetic first shield layer; and

36           the first and second read gap layers being located between the first shield layer and  
37           the first pole piece layer.

1           7.       (Currently Amended)     A magnetic disk drive including at least one magnetic  
2           head assembly that has a head surface and that includes a write head and a read head, comprising:

3           the write head including:

4           ferromagnetic first and second pole pieces that have a yoke portion located between  
5           a pole tip portion and a back gap portion;

6           a nonmagnetic write gap layer located between the pole tip portions of the first and  
7           second pole pieces:

8 an insulation stack with at least one coil layer embedded therein located between  
9 the yoke portions of the first and second pole pieces:  
10 the first and second pole pieces being connected at their back gap portions;  
11 the pole tip portion of the first pole piece having non-overlapping first and second  
12 components wherein the first component forms a portion of the head surface and the  
13 second component is recessed from the head surface and is magnetically connected to the  
14 first component; and  
15 the first and second components having a height into the head assembly which is  
16 measured from a centerline that is perpendicular to said head surface;  
17 each of the first and second components being located along said centerline so that  
18 the centerline bisects each of the first and second components with the second component  
19 being an extension of the first component into the head assembly along the centerline;  
20 the second component having a width that is less than a width of the first  
21 component wherein said widths are parallel to the head surface and parallel to a major  
22 plane of the write gap layer;  
23 the read head including:  
24 a read sensor;  
25 nonmagnetic electrically nonconductive first and second read gap layers;  
26 the read sensor being located between the first and second read gap layers;  
27 a ferromagnetic first shield layer; and  
28 the first and second read gap layers being located between the first shield layer and  
29 the first pole piece;  
30 the first pole piece being located between the read head and the second pole piece;  
31 a housing;  
32 a magnetic disk rotatably supported in the housing;  
33 a support mounted in the housing for supporting the magnetic head assembly with said  
34 head surface facing the magnetic disk so that the magnetic head assembly is in a transducing  
35 relationship with the magnetic disk;  
36 a spindle motor for rotating the magnetic disk;  
37 an actuator positioning means connected to the support for moving the magnetic head  
38 assembly to multiple positions with respect to said magnetic disk; and

39 a processor connected to the magnetic head assembly, to the spindle motor and to the  
40 actuator positioning means for exchanging signals with the magnetic head assembly, for  
41 controlling movement of the magnetic disk and for controlling the position of the magnetic head  
42 assembly.

1 8. (Previously Presented) A magnetic disk drive as claimed in claim 7 further  
2 comprising:

3 the first pole piece layer having a third component that is recessed from the head surface  
4 and has a width that is parallel to the head surface and the major plane of the write gap layer;  
5 the second component interconnecting the first and third components; and  
6 the width of the third component being greater than the width of the second component.

1 9. (Previously Presented) A magnetic disk drive including at least one magnetic  
2 head assembly that has an air bearing surface (ABS) and that includes a write head and a read  
3 head, comprising:

4 the write head including:

5 ferromagnetic first and second pole piece layers that have a yoke portion located  
6 between a pole tip portion and a back gap portion;

7 a nonmagnetic write gap layer located between the pole tip portions of the first and  
8 second pole piece layers;

9 an insulation stack with at least one coil layer embedded therein located between  
10 the yoke portions of the first and second pole piece layers;

11 the first and second pole piece layers being connected at their back gap portions;

12 the pole tip portion of the first pole piece layer having first and second components  
13 wherein the first component forms a portion of the ABS and the second component is  
14 recessed from the ABS and is magnetically connected to the first component;

15 the second component having a width that is less than a width of the first  
16 component wherein said widths are parallel to the ABS and parallel to a major thin film  
17 plane of the write gap layer;

18 the read head including:

19 a read sensor;

20 nonmagnetic electrically nonconductive first and second read gap layers;

21 the read sensor being located between the first and second read gap layers;  
22 a ferromagnetic first shield layer;  
23 the first and second read gap layers being located between the first shield layer and  
24 the first pole piece layer;  
25 the first pole piece layer having a base layer and a pedestal wherein the pedestal  
26 forms a portion of the ABS; and  
27 the pedestal interconnecting the base layer and the first component-;  
28 a housing;  
29 a magnetic disk rotatably supported in the housing;  
30 a support mounted in the housing for supporting the magnetic head assembly with said  
31 ABS facing the magnetic disk so that the magnetic head assembly is in a transducing relationship  
32 with the magnetic disk;  
33 a spindle motor for rotating the magnetic disk;  
34 an actuator positioning means connected to the support for moving the magnetic head  
35 assembly to multiple positions with respect to said magnetic disk; and  
36 a processor connected to the magnetic head assembly, to the spindle motor and to the  
37 actuator positioning means for exchanging signals with the magnetic head assembly, for  
38 controlling movement of the magnetic disk and for controlling the position of the magnetic head  
39 assembly.

1 10. (Original) A magnetic disk drive as claimed in claim 9 further comprising:  
2 the first pole piece layer having a third component that is recessed from the ABS and has  
3 a width that is parallel to the ABS and the major thin film planes of the layers of the sensor;  
4 the second component interconnecting the first and third components; and  
5 the width of the third component being greater than the width of the second component.

1 11. (Currently Amended) A method of making a magnetic head assembly having a  
2 head surface comprising the steps of:  
3 making a write head including the steps of:  
4 forming ferromagnetic first and second pole pieces that have a yoke portion located  
5 between a pole tip portion and a back gap portion;

6 forming a nonmagnetic write gap layer between the pole tip portions of the first and  
7 second pole pieces;  
8 forming an insulation stack with at least one coil layer embedded therein between  
9 the yoke portions of the first and second pole pieces;  
10 connecting the first and second pole pieces at their back gap portions;  
11 forming the pole tip portion of the first pole piece with non-overlapping first and  
12 second components wherein the first component forms a portion of the head surface and  
13 the second component is recessed from the head surface and is magnetically connected to  
14 the first component;  
15 forming the first and second components with a height into the head assembly  
16 which is measured from a centerline that is perpendicular to said head surface;  
17 forming each of the first and second components along said centerline so that the  
18 centerline bisects each of the first and second components with the second component  
19 being an extension of the first component into the head assembly along the centerline;  
20 forming the second component with a width that is less than a width of the first  
21 component wherein said widths are parallel to the head surface and parallel to a major  
22 plane of the write gap layer; and  
23 forming a read head with the first pole piece located between the read head and the  
24 second pole piece.

1 12. (Previously Presented) A method of making a magnetic head assembly as  
2 claimed in claim 11 further comprising the steps of:

3 forming the first pole piece layer with a third component that is recessed from the head  
4 surface and with a width that is parallel to the head surface and the major plane of the write gap  
5 layer;  
6 forming the second component interconnecting the first and third components; and  
7 forming the width of the third component greater than the width of the second component.

1 13. (Previously Presented) A method of making a magnetic head assembly having  
2 an air bearing surface (ABS) and comprising the steps of:

3 making a write head including the steps of:  
4 forming ferromagnetic first and second pole piece layers that have a yoke portion  
5 located between a pole tip portion and a back gap portion;



6 forming a nonmagnetic write gap layer between the pole tip portions of the first and  
7 second pole piece layers;

8 forming an insulation stack with at least one coil layer embedded therein between  
9 the yoke portions of the first and second pole piece layers;

10 connecting the first and second pole piece layers at their back gap portions;

11 forming the pole tip portion of the first pole piece layer with first and second  
12 components wherein the first component forms a portion of the ABS and the second  
13 component is recessed from the ABS and is magnetically connected to the first component;  
14 and

15 forming the second component with a width that is less than a width of the first  
16 component wherein said widths are parallel to the ABS and parallel to a major thin film  
17 plane of the write gap layer;

18 forming the first pole piece layer with a third component that is recessed from the  
19 ABS and with a width that is parallel to the ABS and the major thin film plane of the write  
20 gap layer;

21 forming the second component interconnecting the first and third components;

22 forming the width of the third component greater than the width of the second  
23 component;

24 forming the first pole piece layer with a base layer and a pedestal wherein the  
25 pedestal forms a portion of the ABS; and

26 forming the pedestal interconnecting the base layer and the first component.

1 14. (Previously Presented) A method of making a magnetic head assembly as  
2 claimed in claim 11 further comprising the steps of:

3 making the read head including the steps of:

4 forming a read sensor;

5 forming nonmagnetic electrically nonconductive first and second read gap layers  
6 with the read sensor located between the first and second read gap layers; and

7 forming a ferromagnetic first shield layer with the first and second read gap layers  
8 located between the first shield layer and the first pole piece.

1           15.     (Previously Presented)     A method of making a magnetic head assembly as  
2     claimed in claim 14 further comprising the steps of:

3           forming the first pole piece with a third component that is recessed from the head surface  
4     and with a width that is parallel to the head surface and the major plane of the write gap layer;  
5           forming the second component interconnecting the first and third components; and  
6           forming the width of the third component greater than the width of the second component.

1           16.     (Previously Presented)     A method of making a magnetic head assembly having  
2     an air bearing surface (ABS) and comprising the steps of:

3           making a write head including the steps of:

4           forming ferromagnetic first and second pole piece layers that have a yoke portion  
5     located between a pole tip portion and a back gap portion;

6           forming a nonmagnetic write gap layer between the pole tip portions of the first and  
7     second pole piece layers;

8           forming an insulation stack with at least one coil layer embedded therein between  
9     the yoke portions of the first and second pole piece layers;

10          connecting the first and second pole piece layers at their back gap portions;

11          forming the pole tip portion of the first pole piece layer with first and second  
12     components wherein the first component forms a portion of the ABS and the second  
13     component is recessed from the ABS and is magnetically connected to the first component;  
14     and

15          forming the second component with a width that is less than a width of the first  
16     component wherein said widths are parallel to the ABS and parallel to a major thin film  
17     plane of the write gap layer;

18          forming the first pole piece layer with a third component that is recessed from the  
19     ABS and with a width that is parallel to the ABS and the major thin film plane of the write  
20     gap layer;

21          forming the second component interconnecting the first and third components;

22          forming the width of the third component greater than the width of the second  
23     component;

24          forming the first pole piece layer with a base layer and a pedestal wherein the  
25     pedestal forms a portion of the ABS; and

forming the pedestal interconnecting the base layer and the first component;  
making a read head including the steps of:  
forming a read sensor;  
forming nonmagnetic electrically nonconductive first and second read gap layers  
with the read sensor located between the first and second read gap layers; and  
forming a ferromagnetic first shield layer with the first and second read gap layers  
located between the first shield layer and the first pole piece layer.

17. (Currently Amended) A magnetic head assembly having a head surface and  
comprising:

a write head including:

ferromagnetic first and second pole pieces that have a yoke portion located between  
a pole tip portion and a back gap portion;

a nonmagnetic write gap layer located between said pole tip portions;

an insulation stack with at least one coil layer embedded therein located between  
said yoke portions;

the first and second pole pieces being connected at their back gap portions; and

the pole tip portion having of the first pole piece having a full portion and a  
reduced cross-section portion wherein the full portion forms a portion of the head surface  
and the reduced cross-section portion is located entirely within a region which is recessed  
from said head surface;

the first and second portions having a height into the head assembly which is  
measured from a centerline that is perpendicular to said head surface;

each of the first and second portions being located along said centerline so that the  
centerline bisects each of the first and second portions with the second portion being an  
extension of the first portion into the head assembly along the centerline;

a read head; and

the first pole piece being located between the read head and the second pole piece.

1           18.   (Previously Presented)   A magnetic head assembly as claimed in claim 17 further  
2 comprising:

3           the read head including:

4                 a read sensor;  
5                 nonmagnetic electrically nonconductive first and second read gap layers;  
6                 the read sensor being located between the first and second read gap layers;  
7                 a ferromagnetic first shield layer; and  
8                 the first and second read gap layers being located between the first shield layer and  
9           the first pole piece.

1           19.   (Currently Amended)   A magnetic disk drive including at least one magnetic  
2 head assembly that has a head surface and that includes a write head and a read head, comprising:

3           the write head including:

4                 ferromagnetic first and second pole pieces that have a yoke portion located between  
5           a pole tip portion and a back gap portion;

6                 a nonmagnetic write gap layer located between said pole tip portions;  
7                 an insulation stack with at least one coil layer embedded therein located between  
8           said yoke portions;

9                 the first and second pole pieces being connected at their back gap portions; and

10                 the pole tip portion having of the first pole piece having a full portion and a  
11 reduced cross-section portion wherein the full portion forms a portion of the head surface  
12 and the reduced cross-section portion is located entirely within a region which is recessed  
13 from said head surface;

14                 the first and second portions having a height into the head assembly which is  
15 measured from a centerline that is perpendicular to said head surface;

16                 each of the first and second portions being located along said centerline so that the  
17 centerline bisects each of the first and second portions with the second portion being an  
18 extension of the first portion into the head assembly along the centerline;

19           the read head including:

20                 a read sensor;  
21                 nonmagnetic electrically nonconductive first and second read gap layers;  
22                 the read sensor being located between the first and second read gap layers;  
23                 a ferromagnetic first shield layer; and

24 the first and second read gap layers being located between the first shield layer and  
25 the first pole piece layer;  
26 the first pole piece being located between the read head and the second pole piece;  
27 a housing;  
28 a magnetic medium supported in the housing;  
29 a support mounted in the housing for supporting the magnetic head assembly with said  
30 head surface facing the magnetic medium so that the magnetic head assembly is in a transducing  
31 relationship with the magnetic medium; and  
32 a processor connected to the magnetic head assembly for exchanging signals with the  
33 magnetic head assembly.

1 20. (Currently Amended) A method of making a magnetic head assembly having  
2 a head surface and comprising the steps of:

3 making a write head including the steps of:

4 forming ferromagnetic first and second pole pieces with a yoke portion located  
5 between a pole tip portion and a back gap portion;

6 forming a nonmagnetic write gap layer between said pole tip portions;

7 forming an insulation stack with at least one coil layer embedded therein between  
8 said yoke portions;

9 connecting the first and second pole pieces at their back gap portions; and

10 forming the pole tip portion of the first pole piece with a full portion and with a  
11 reduced cross-section portion wherein the full portion forms a portion of the head surface  
12 and the reduced cross-section portion is located entirely within a region which is recessed  
13 from said head surface; and

14 forming the first and second portions with a height into the head assembly which  
15 is measured from a centerline that is perpendicular to said head surface;

16 forming each of the first and second portions along said centerline so that the  
17 centerline bisects each of the first and second portions with the second portion being an  
18 extension of the first portion into the head assembly along the centerline;

19 forming a read head with the first pole piece located between the read head and the  
20 second pole piece.

1           21.   (Previously Presented)   A magnetic head assembly that has a head surface  
2 comprising:

3           a write head including:

4                 ferromagnetic first and second pole piece layers that have a yoke portion located  
5 between a pole tip portion and a back gap portion;

6                 a nonmagnetic write gap layer located between the pole tip portions of the first and  
7 second pole piece layers;

8                 an insulation stack with at least one coil layer embedded therein located between  
9 the yoke portions of the first and second pole piece layers;

10                the first and second pole piece layers being connected at their back gap portions;

11                the pole tip portion of the first pole piece layer having first and second components  
12 wherein the first component forms a portion of the head surface and the second component  
13 is recessed from the head surface and is magnetically connected to the first component;

14                the second component having a width that is less than a width of the first  
15 component wherein said widths are parallel to the head surface and parallel to a major thin  
16 film plane of the write gap layer;

17                the first pole piece layer having a base layer and a pedestal wherein the pedestal  
18 forms a portion of the head surface and is located between the head surface and the  
19 insulation stack; and

20                the pedestal interconnecting the base layer and the first component.

1           22.   (Previously Presented)   A magnetic head assembly as claimed in claim 21 further  
2 comprising:

3           a read head; and

4           the first pole piece layer being located between the read head and the second pole piece  
5 layer.

1           23.   (Previously Presented)   A method of making a magnetic head assembly that has  
2 a head surface comprising the steps of:

3           making a write head including the steps of:

4                 forming ferromagnetic first and second pole piece layers that have a yoke portion  
5 located between a pole tip portion and a back gap portion;

6 forming a nonmagnetic write gap layer between the pole tip portions of the first and  
7 second pole piece layers;

8 forming an insulation stack with at least one coil layer embedded therein located  
9 between the yoke portions of the first and second pole piece layers;

10 connecting the first and second pole piece layers at their back gap portions;

11 forming the pole tip portion of the first pole piece layer with first and second  
12 components wherein the first component forms a portion of the head surface and the  
13 second component is recessed from the head surface and is magnetically connected to the  
14 first component;

15 forming the second component with a width that is less than a width of the first  
16 component wherein said widths are parallel to the head surface and parallel to a major thin  
17 film plane of the write gap layer;

18 forming the first pole piece layer with a base layer and a pedestal wherein the  
19 pedestal forms a portion of the head surface and is located between the head surface and  
20 the insulation stack; and

21 forming the pedestal to interconnect the base layer and the first component.

1 24. (Previously Presented) A method as claimed in claim 23 further comprising the  
2 step of:

3 forming a read head with the first pole piece layer located between the read head and the  
4 second pole piece layer.